106-84

106/84

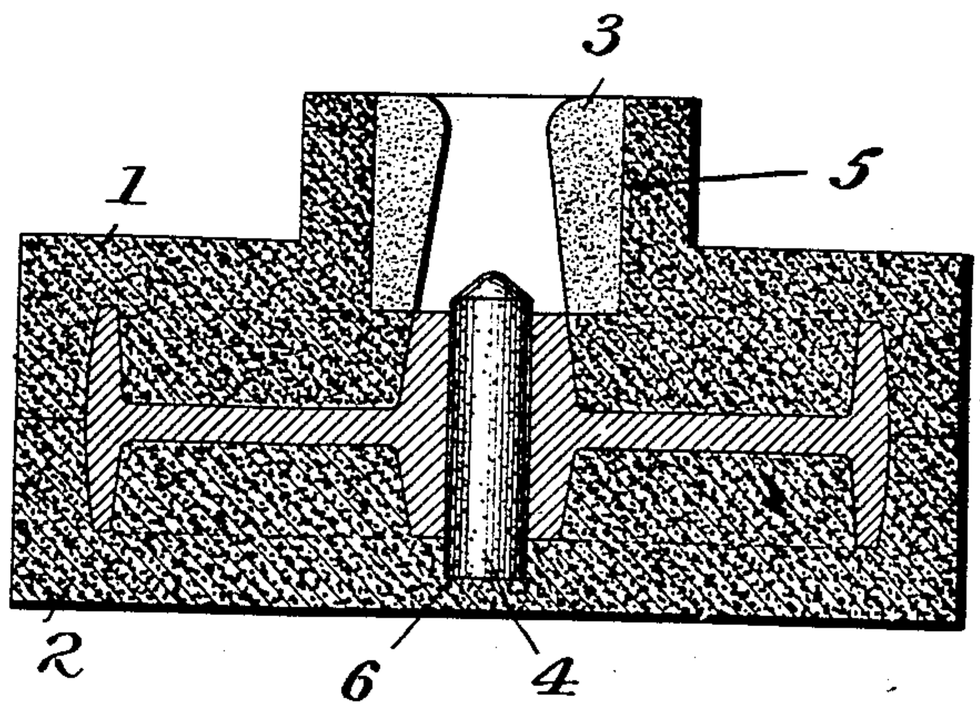
CROSS REFERENCE EXAMINER

No. 881,645. PATENTED MAR. 10, 1908.

E. G. ACHESON.

MOLD AND MOLD LINING.

APPLICATION FILED DEC. 13, 1904.



Witnesses
J. G. Stinkel
Wm. Gilman, Jr.

Inventor
Edward G. Acheson
by Foster Freeman & Watson
Attorneys

UNITED STATES PATENT OFFICE.

EDWARD GOODRICH ACHESON, OF STAMFORD TOWNSHIP, WELLAND COUNTY, ONTARIO, CANADA.

MOLD AND MOLD-LINING.

No. 881,645. Specification of Letters Patent. Patented March 10, 1908.

Application filed December 13, 1904. Serial No. 236,672.

To all whom it may concern:

Be it known that I, EDWARD GOODRICH ACHESON, a citizen of the United States, residing in Stamford township, in the county of Welland, Province of Ontario, Canada, have invented certain new and useful Improvements in Molds and Mold-Linings, of which the following is a specification.

This invention is a permanent non-metallic mold for the production of metal castings.

The mold or mold lining consists of a porous mass of particles of siloxicon cemented together by a permanent binder, for example sodium silicate.

The mold may have a gate of yielding material such as green sand, or an inwardly-flaring gate, to permit inward movement of the sprue, as the cast metal contracts on cooling.

As a concrete illustration of the invention a pulley mold has been shown in the accompanying drawing, the view being an axial section.

The mold comprises a siloxicon cope and drag 1, 2, a green sand gate 3 and a baked sand core 4. The gate is supported in a recess 5 in the cope and the core is supported in a recess 6 in the drag.

In constructing the improved mold, siloxicon is crushed, preferably to pass a 20-mesh sieve, and mixed with an aqueous solution of sodium silicate having a specific gravity of 1.10, in sufficient proportion to produce a mixture having about the consistency of ordinary molding sand. The mixture is then molded by hand or machine, being tamped or compressed around the pattern, and the mold or mold sections are baked at a sufficient temperature to substantially eliminate the moisture, as in a core oven. The particles of siloxicon are thereby rigidly cemented together and the product is a porous, permanent mass.

If desired, the mold may be vented before it is baked by the use of venting wires, or a combustible ingredient such as sawdust may be mixed with the siloxicon and burned out during or after the baking.

For the production of especially smooth castings, it is desirable to make the inner portions of the walls of the mold of finer particles of siloxicon than those which are used for the body of the mold. It is also desirable, before making the first casting, to brush the inner mold surface with ground plumbago, to prevent the cast metal from adhering to the sodium silicate.

A mold produced by the described process may be used without injury for the production of an indefinite number of castings. The castings may be, and preferably are, cast in rapid succession, thereby maintaining the mold at a high temperature. The mold may advantageously be used for the production of solid steel ingots. Physically considered, the mold is strong, porous and refractory, and has a hard, smooth surface to which iron does not adhere. The material is of low heat-conductivity, giving soft castings, and has a low coefficient of expansion, avoiding strains in the castings. Chemically considered, the mold is inert or neutral. The material does not dissolve in or chemically modify castings of iron or steel, as do molds of carbon.

Instead of using a temporary gate of sand or other yielding material, a permanent gate may be molded directly in the siloxicon mass. Such gate should preferably flare inwards to permit inward movement of the sprue as the cast metal contracts.

The term "siloxicon," as used in this specification, is intended to cover any compound containing silicon, carbon and oxygen, and the expression "particles of siloxicon" is intended to cover particles consisting in whole or part of silixcon. The siloxicon mold of this application is to be distinguished from the brick, crucible or muffle described and claimed in my Patent No. 722,793, granted March 17, 1903. The mold or mold lining is a porous, conglomerate mass of discrete particles or fragments of siloxicon, cemented together by a permanent binder. The article of the specified patent is a dense, homogeneous mass of siloxicon, shaped by the use of a temporary binder such as glue-water and fired at such high temperatur that it is fritted into a body in which the particles directly cohere or coalesce.

What I claim is:—

1. The herein described mold comprising a porous body composed of crushed siloxicon, the particles of which are rigidly cemented together and from which the moisture has been eliminated.

2. The herein described mold comprising a porous body composed of crushed siloxicon, the particles of which are rigidly cemented together and from which the moisture has been eliminated, the said body having low heat conductivity and a low coefficient of expansion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD GOODRICH ACHESON.

Witnesses:
HUGH M. STERLING,
FRANK L. FREEMAN.